SIGMA-ALDRICH

Material Safety Data Sheet

Date Printed: 09/05/2008
Date Updated: 10/06/2006
Version 1.90

Section 1 - Product and Company Information

Product Name PYRENE, FOR FLUORESCENCE
Product Number 82648
Brand Fluka Chemical

Company Sigma-Aldrich
Address 3050 Spruce Street
City, State, Zip, Country SAINT LOUIS, MO 63103 US
Technical Phone: 800-325-5832 **Emergency Phone:** 314-776-6555
Fax: 800-325-5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
PYRENE	129-00-0	Yes	204-927-3	

Formula C16H10
Synonyms Benzo(def)phenanthrene, Coal tar pitch volatiles:pyrene (OSHA), Pyren (German), beta-Pyrene

Section 3 - Hazards Identification

Emergency Overview
Dangerous for the environment.
Very toxic to aquatic organisms, may cause longterm adverse effects in the aquatic environment.
Readily absorbed through skin. Target organ(s): Blood, Kidneys.

HMIS Rating
Health: 1* Flammability: 0 Reactivity: 0

NFPA Rating
Health: 0 Flammability: 0 Reactivity: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation Exposure
If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

Dermal Exposure
In case of contact, immediately wash skinwith soap and copious amounts of water.

Eye Exposure
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

Flash Point: > 392 °F > 200 °C

Autoignition Temp: N/A

Extinguishing Media
Suitable
Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

Firefighting
Protective Equipment
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s)
Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill
Evacuate area.

Procedure(s) of Personal Precaution(s)
Exercise appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of dust.

Methods for Cleaning Up
Sweep up, place in a bag and hold for waste disposal.Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling
User Exposure
Avoid inhalation. Avoid contact with eyes, skin, and clothing.Avoid prolonged or repeated exposure.

Storage
Suitable
Keep tightly closed.

Section 8 - Exposure Controls / PPE

Engineering Controls
Safety shower and eye bath.Mechanical exhaust required.

Personal Protective Equipment
Respiratory
Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks.
Hand
Protective gloves.
Eye
Chemical safety goggles.

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General Hygiene Measures
Wash thoroughly after handling.

Exposure Limits, RTECS

Country	Source	Type	Value
USA	OSHA	PEL	8H TWA 0.2 MG/M3

Section 9 - Physical/Chemical Properties

Appearance

Physical State	Color	Form
Solid	White	Fine crystals

Molecular Weight	202.26 AMU
pH	N/A
BP/BP Range	390 - 395 °C
MP/MP Range	151 °C
Freezing Point	N/A
Vapor Pressure	N/A
Vapor Density	N/A
Saturated Vapor Conc.	N/A
SG/Density	1.21 g/cm3
Bulk Density	650 kg/l
Odor Threshold	N/A
Volatile%	N/A
VOC Content	N/A
Water Content	N/A
Solvent Content	N/A
Evaporation Rate	N/A
Viscosity	N/A
Partition Coefficient	Log Kow: 4.88
Decomposition Temp.	N/A
Flash Point °F	> 392 °F
Flash Point °C	> 200 °C
Explosion Limits	N/A
Flammability	N/A
Autoignition Temp	N/A
Solubility	N/A

N/A = not available

Section 10 - Stability and Reactivity

Stability
Stable
Stable.
Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products
Hazardous Decomposition Products
Carbon monoxide, Carbon dioxide

Hazardous Polymerization
Hazardous Polymerization
Will not occur.

Section 11 - Toxicological Information

Route of Exposure
Skin Contact
May cause skin irritation.
Skin Absorption
May be harmful if absorbed through the skin.Readily absorbed through skin.
Eye Contact
May cause eye irritation.
Inhalation
May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion
May be harmful if swallowed.

Target Organ(s) or System(s)
Liver. Blood. Kidneys.

Signs and Symptoms of Exposure
Inhalation studies in animals have caused hepatic, pulmonary, and intragastric pathologic changes. Neutrophil, leukocyte, and erythrocyte levels also decreased. Cutaneous application caused hyperemia, weight loss, and hematopoietic changes and dermatitis. Chronic effects: leukocytosis.

RTECS Number: UR2450000

Toxicity Data

Oral - Rat: > 16,000 mg/kg(LD50)

Oral - Rat: 2700 mg/kg (LD50)
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Conjunctive irritation.
Behavioral:Excitement.
Behavioral:Muscle contraction or spasticity.

Inhalation - Rat: 170 mg/m3 (LC50)
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Conjunctive irritation.
Behavioral:Excitement.
Behavioral:Muscle contraction or spasticity.

Oral - Mouse: 800 mg/kg (LD50)
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Conjunctive irritation.
Behavioral:Excitement.
Behavioral:Muscle contraction or spasticity.

Intraperitoneal - Mouse: 514 MG/KG (LD50)

Irritation Data

Eyes - Rabbit:
Remarks: Mild irritation effect

Skin - Rabbit: 500 mg 24H
Remarks: Mild irritation effect

Chronic Exposure- Carcinogen
Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Mouse - Skin: 10 GM/KG 3W I
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria.Skin and Appendages: Other: Tumors.

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IARC Carcinogen List
Rating
Group 3

Chronic Exposure- Mutagen

Species	*Dose*	*Cell Type*	*Mutation test*
Result: Laboratory experiments have shown mutagenic effects.			
Human	100 MG/L	fibroblast	Unscheduled DNA synthesis
Human	100 UMOL/L	lymphocyte	Sister chromatid exchange
Human	12 UMOL/L	Other cell types	Mutation in mammalian somatic cells.
Rat	2500 UMOL/L	liver	Unscheduled DNA synthesis
Rat	10 MG/L	Embryo	Mutation in mammalian somatic cells.
Mouse	10100 NMOL/L (+S9)	lymphocyte	Mutation in microorganisms
Mouse	10 MG/L	Embryo	Morphological transformation.
Mouse	50 UMOL/L	lymphocyte	DNA damage
Mouse	1510 UMOL/L	lymphocyte	Mutation in mammalian somatic cells.
Hamster	10 MG/L	Embryo	Morphological transformation.
Hamster	62500 UG/L	kidney	Morphological transformation.
Hamster	100 UMOL/L	liver	Unscheduled DNA synthesis
Hamster	10 MG/L	lung	Cytogenetic analysis

Section 12 - Ecological Information

Acute Ecotoxicity Tests
Test Type
EC50 Daphnia
Species
Daphnia magna

Time:	**Value:**
48.0 h	0.002 - 0.003 mg/l

Test Type
LC50 Fish
Species
Onchorhynchus mykiss (Rainbow trout)

Time:	**Value:**
96.0 h	> 2 mg/l

Additional Results/Data from Relevent Scientific Experiments
Avoid contamination of the environment

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation
Contact a licensed professional waste disposal service to dispose of this material.
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s.
UN#: 3077
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s
IATA UN Number: 3077
Hazard Class: 9
Packing Group: III

Section 15 - Regulatory Information

EU Additional Classification
Symbol of Danger: N
Indication of Danger
Dangerous for the environment.
Risk Statements **R:** 50/53
Very toxic to aquatic organisms, may cause longterm adverse effects in the aquatic environment.
Safety Statements **S:** 60 61
This material and its container must be disposed of as hazardous wasteAvoid release to the environment.Refer to special instructions/safety data sheets.

US Classification and Label Text
Indication of Danger
Dangerous for the environment.
Risk Statements
Very toxic to aquatic organisms, may cause longterm adverse effects in the aquatic environment.
Safety Statements
This material and its container must be disposed of as hazardous wasteAvoid release to the environment. Refer to special instructions/safety data sheets.
US Statements
Readily absorbed through skin.Target organ(s): Blood. Kidneys.

United States Regulatory Information
SARA Listed: Yes
Notes: This product is subject to SARA section 313 reporting requirements.

TSCA Inventory Item: Yes

Canada Regulatory Information
WHMIS Classification
This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

Disclaimer
For R&D use only. Not for drug, household or other uses.

Warranty
The above information is believed to be correct but does notpurport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. SigmaAldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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Material Safety Data Sheet

Date Printed: 10/08/2008
Date Updated: 02/02/2007
Version 1.50

Section 1 - Product and Company Information

Product Name Propionic-1-^{13}C acid, 99 atom % ^{13}C
Product Number 282448
Brand Aldrich Chemical

Company Sigma-Aldrich
Address 3050 Spruce Street
City, State, Zip, Country SAINT LOUIS, MO 63103 US
Technical Phone: 800-325-5832 **Emergency Phone:** 314-776-6555
Fax: 800-325-5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
PROPIONIC-1-13C ACID, 99 ATOM % 13C	6212-69-7	No		607-089-00-0

Formula 13C3H6O2
Synonyms propanoic-2,3-13C2 acid

Section 3 - Hazards Identification

Emergency Overview
Combustible (USA) Flammable (EU). Corrosive.
Harmful in contact with skin. Causes burns.
Readily absorbed through skin. Target organ(s): Central nervous system. Blood. Combustible.

HMIS Rating
Health: 3* Flammability: 2 Reactivity: 1

NFPA Rating
Health: 3 Flammability: 2 Reactivity: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure
If swallowed, wash out mouth with water provided person is conscious. Call a physicianDo not induce vomiting.

Inhalation Exposure
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Dermal Exposure
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

Eye Exposure
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Information for Physician
Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water.

Information for Physician
Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water.

Section 5 - Fire Fighting Measures

Flash Point: 129.2 °F 54 °C

Explosion Limits: **Lower:** 2.9 % **Upper:** 12.1 %

Autoignition Temp: 513 °C

Extinguishing Media
Suitable
Carbon dioxide, dry chemical powder, or appropriate foam.

Firefighting
Protective Equipment
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s)
Combustible liquid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill
Evacuate area.

Procedure(s) of Personal Precaution(s)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up
Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposaVentilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling
User Exposure
Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

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Storage
Suitable
Keep tightly closed. Keep away from heat and open flame.Store in a cool dry place.

Special Requirements
Hygroscopic.

Section 8 - Exposure Controls / PPE

Engineering Controls
Safety shower and eye bath.Use only in a chemical fume hood.

Personal Protective Equipment
Respiratory
Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).Where risk assessment shows air-purifying respirators are appropriate use a full face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full face supplied air respirator.
Hand
Compatible chemical-resistant gloves.
Eye
Chemical safety goggles.
Other
Faceshield (8-inch minimum).

General Hygiene Measures
Wash contaminated clothing before reuse.Discard contaminated shoes.Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance

Physical State	Color
Clear liquid	Colorless

Molecular Weight	74.08 AMU		
pH	2.5	20 °C	Concentration: 100 g/l
BP/BP Range	141 - 142 °C		
MP/MP Range	-24 - -23 °C		
Freezing Point	N/A		
Vapor Pressure	2.4 mmHg	20 °C	
Vapor Density	2.55 g/l		
Saturated Vapor Conc.	N/A		
SG/Density	0.992 g/cm3		
Bulk Density	N/A		
Odor Threshold	N/A		
Volatile%	N/A		
VOC Content	N/A		
Water Content	N/A		
Solvent Content	N/A		
Evaporation Rate	N/A		
Viscosity	10 Pas	25 °C	
Surface Tension	27.21 mN/m	15 °C	
Partition Coefficient	Log Kow: 0.25		
Decomposition Temp.	N/A		
Flash Point °F	129.2 °F		Method: closed cup
Flash Point °C	54 °C		Method: closed cup
Explosion Limits	Lower: 2.9 %		
	Upper: 12.1 %		
Flammability	N/A		

Autoignition Temp	513 °C
Refractive Index	1.387
Solubility	
Solubility in Water:	Soluble.
Other Solvents:	ALCOHOL, ETHER, CHLOROFORM

N/A = not available

Section 10 - Stability and Reactivity

Stability
Stable
Stable.
Conditions of Instability
Hygroscopic.
Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products
Hazardous Decomposition Products
Carbon monoxide, Carbon dioxide

Hazardous Polymerization
Hazardous Polymerization
Will not occur.

Section 11 - Toxicological Information

Route of Exposure
Skin Contact
Causes burns.
Skin Absorption
Harmful if absorbed through skin.Readily absorbed through skin.
Eye Contact
Causes burns.
Inhalation
May be harmful if inhaled.Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion
May be harmful if swallowed.

Target Organ(s) or System(s)
Central nervous system. Blood. Liver. Kidneys.

Signs and Symptoms of Exposure
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.May cause an asthmatic-like bronchitis. Nausea, dizziness, and headache.Blood effects.

RTECS Number: N/A

Toxicity Data
Oral - Rat: 3,500 - 4,200 mg/kg(LD50)
Skin - Rabbit: 500 mg/kg(LD50)
Inhalation - Rat: >4.9 MG/L(LC50)

Section 12 - Ecological Information

Acute Ecotoxicity Tests

Test Type
EC50 Algae

Time:	**Value:**
72.0 h	45.8 mg/l

Test Type
EC50 Daphnia
Species
Daphnia magna

Time:	**Value:**
48.0 h	21 - 24.6 mg/l

Test Type
LC50 Fish
Species
Lepomis macrochirus (Bluegill)

Time:	**Value:**
96.0 h	73 - 115 mg/l

Test Type
LC50 Fish
Species
Onchorhynchus mykiss (Rainbow trout)

Time:	**Value:**
96.0 h	51 - 73.2 mg/l

Section 14 - Transport Information

DOT
Proper Shipping Name: Propionic acid
UN#: 3463
Class: 8
Packing Group: Packing Group II
Hazard Label: Corrosive
Hazard Label: Flammable liquid
PIH: Not PIH

IATA
Proper Shipping Name: Propionic acid
IATA UN Number: 3463
Hazard Class: 8
Packing Group: II

Section 15 - Regulatory Information

EU Directives Classification
Symbol of Danger: C
Indication of Danger
Corrosive.
Risk Statements **R:** 34
Causes burns.
Safety Statements **S:** 23 36 45
Do not breathe vapor.Wear suitable protective clothing. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US Classification and Label Text
Indication of Danger
Combustible (USA) Flammable (EU). Corrosive.
Risk Statements
Harmful in contact with skin. Causes burns.

Safety Statements
Keep away from sources of ignition- no smoking. Do not breathe vapor.In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.Wear suitable protective clothing, gloves, and eye/face protection.In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
US Statements
Readily absorbed through skin. Target organ(s): Central nervous system. Blood. Combustible.

United States Regulatory Information
SARA Listed: No

Canada Regulatory Information
WHMIS Classification
This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: No
NDSL: No

Section 16 - Other Information

Disclaimer
For R&D use only. Not for drug, household or other uses.

Warranty
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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